Efficacy of Some Fungicides and Resistance to Grace Some Grape Cultivars

Agriculture

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Abstract

Grace grape (Uncinula necator) after the blight is the most important disease of grapes which causes great damage to this crop. This year work is done in order to research the most effective preparations to control the ash as well as assigning more sustainable cultivars to ash. The experiment is located in the municipality of Rahovec and cultivars Frankovka it in black and Burgundez was followed during 2013. For evaluating the effectiveness of the preparation and control of ash are using these chemical preparations: QUADRIS (Azoksistrobin), Falcon EC460 (tebuconazole, Triadimenol, Spiroxamin), COSA (prep. squfuri), Bayleton (Triadimefon). Karathane EC (Dinokap), Anvil (Heksakonazol), Rubigan (Fenarimol) and Saprol (Triforin). First spray against ash is made when shoots have reached 20 cm length. While the other sprays are made after every 12-15 days, splash total to six. Throughout vegetation made four assessments of disease, such as: first evaluation is done at the stage of entering the grains, then after every 15 to 20 days of an assessment. More resistant cultivar is shown Burgundezi ash black where the leaf disease index was 10.92 %, 20.36 % respectively in castles, while cultivar Frankovka had foliar disease index 15.95 %, respectively 25, and 29 % in the encampments. While regarding the efficacy of chemicals to control most successful ash are shown preparations that are used in variant B2 (Bayleton and Falcon EC460) where foliar disease index was 7.17 % and 12.71 % in the encampments. These results are highly significant compared with other options.

Introduction

Until the nineteenth century, Vineyards in Europe is developed with high intensity.

This high intensity of development is interrupted by the arrival of diseases imported from America. Grace first appeared in Europe in 1845 (in England), and Smut by 1878. So at this time (early nineteenth century) initiated the research of these pathogens and chemicals finding against these diseases.

Grace grape (Uncinula necator) unlike Smut place without the presence of moisture and causes damage over vegetation. The optimum temperature for germination of conidia and causing infection is 25-28 ℃ (Boubals 1988). Conidia sprouted starting temperature 6 ℃ to 32 ℃, while the optimum temperature for their germination is 20-27 ℃ (Pearson 1990). When conditions are suitable for the development of the pathogen, it can reduce performance by 80 % (Susuri 1995).

Grace Vine except that the percentage decreases performance in high pathogen affects negatively the grape reduction. Before the war in our country there were about 13,000 ha. With grape vines (most varieties for wine production, but also for true cultivars). From all this area was 38 % in the public sector and 62 % in private it. Based on official data of 2006, there were about 4,538 Kosovo ha, with grape vines, tending to increase. Average yield of grapes to us revolves around 7 t. / ha.

Materials and Methods

Effectiveness of fungicides for control of ash and pathogen research are made during 2013 and that the cultivars Burgundez Frankovka and black. These two grape cultivars are known for producing quality wines. This research is situated in Rahovec vineyard region.

For pathogen control and evaluate the effectiveness of these preparations are using chemical preparations: QUADRIS (Azoksistrobin) in conc. 0.075%, Falcon EC460 (tebuconazole, Triadimenol, Spiroxamin) in conc. 0.04%, COSA (prep. Squlfuri) in conc. 0.3%, Bayleton (Triadimefon) in konc.0, 02%, Karathane EC (Dinokap) in conc. 0.1%, Anvil (Heksakonazol) in conc. 0.065% Rubigan EC (Fenarimol) in conc. 0.03% and Saprol (Triforin) in conc. 0.1%. These preparations are used in seven combinations (variants) and that:

1. Quadris for the first two treatments, then Cosa preparation.
2. Bayleton + Falcon EC460, changeable application.
3. Bayleton + Carathan EC application variable.
4. Falcon EC460 + Anvil, changeable application.
5. Rubigan EC + Cosa, changeable application.
6. Saprol + Carathan EC application commutable
7. Control.

Spraying is done with backpack pumps with a capacity of 10 l. To each variant were followed by 10 troops vine. So every variant has been placed between the two columns (10 m. Longitude). Throughout vegetation touching the vine assessment of pathogen is done four times and assess the first phase connecting grains and then after every 10 to 18 days of evaluation. Evaluation is done by checking out 100 leaves and 50 bunches for each variant. Is used to estimate the rate on 5 classes (class 0, infection, grade 1 to 10 % of poor infection, class 2 with 11-20 % average infection, grade 3 infection with 21-50 % higher and 50 % grade 4 infection very high) bibliographic sources (Josifović 1956 Ruçi 2004).

The results of these surveys are processed for each variant according Mcneyt index (Index Mc) and then were processed statistically - Analysis of variance (ANOVA). For the research setting we used factorial scheme with two factors: preparation factor with 7 levels and cultivars factor with two levels in two blocks with random ranking. Throughout there was total vegetation spraying 6. Spraying is done when the first shoots have been the length 20 cm. (on 04.06.2013). While other sprays are made after every 12-16 days until the start of changing the color of the grain when sprays are discontinued.

Results and Discussion

Results and discussion of grace in their leaves.

Based on the results obtained during the research shows that infection (percentage disease index) was higher in comparison with infection encampments in the leaves. Statistical processing of the results shows that the ash leaves significant differences existed regarding cultivars (Fac. A) Where the highest index of infestation by disease had Frankovka cultivar (15.95 %), while the smallest of cultivar Burgundez black (10.95 %). Therefore we say that black Burgundez cultivar showed the lowest vulnerability to pathogen ash in the same conditions of cultivation. There were very significant differences in terms of efficiency and preparations (Fac.B) between preparations as well as in comparison with control. The highest rate of infection has been in control variant B7 (22.43 %), while the lowest is the variant B2 (7.17 %) which are used chemical preparations, and Falcon Bayleton the combination of EC460 in changeable.

Significant differences were also among the chemicals so that the index higher was the variant disease B5 (17.36 %) which are used Rubigan preparation and Cosa, while the lowest variant B2 (7.17 %) where Falcon preparation used Bayleton EC460 and so interchangeable.

Even the terms of blocks (Fac.C) differences were observed only for the first level probability (95 %).

Even to the interaction between the factors are found statistical differences sinjifikative. To interaction A x B (cultivar x preparation) higher index of disease has been to control (variant B7) to the two cultivars. Frankovka cultivar had the highest index of disease (24.72 %), while cultivar black Burgundez lowest (21.16 %). In statistical point of view, these differences are highly significant. Therefore, we say that black Burgundez cultivar is more sustainable than the pathogen to Frankovka. There were significant differences between preparations. By interaction (A x B) higher index of disease was found in cultivar Frankovka - B1 variant (20.06 %) which are used Quadris preparation and Cosa, while the cultivar lowest Burgunsez black - variant B2 (5.25 %) which is using the combination Falcon EC460 and Bayleton. These differences are highly significant statistical standpoint.

Interaction (AXC) between cultivars and blocks resulted in only significant difference between the cultivars, while in between the blocks there was no difference.

This speaks to the differences in susceptibilities of pathogens between cultivars in the study. Higher index of disease has been Frankovka cultivar (16.10 %), while the lowest to Burgundez black cultivar (10.82 %). Interaction to B X C (preparations x blocks) are also found statistically significant differences on various levels. The higher value of the index of disease control options besides high was also to variant B5 x C2 (19.56 %), while the lowest variant B2 x C2 (6.81 %).

Tab 1. Analysis of variance and LSD for grace (U. necator) in leaves (2013)

Cultivar Fac. (A)	Preparation Fac. (B)	*Blocks, Fac. (C)*		Average (A x B)	Average (A)
		C_1	C_2		
Frankovka	B_1	19.63	20.50	20.06**	15.95**
	B_2	9.69	8.50	9.09**	
	B_3	15.94	15.00	15.47	
	B_4	10.06	10.50	10.28	
	B_5	18.63	19.19	18.91	
	B_6	12.56	13.75	13.16	
	B_7	24.13	25.31	24.72**	
	Average (A x C)	15.80	16.10**		
Black Burgundez	B_1	13.25	12.50	12.86**	10.92**
	B_2	5.38	5.13	5.25**	
	B_3	10.50	11.25	10.88	
	B_4	6.94	6.44	6.69	
	B_5	11.69	19.94	11.81	
	B_6	8.00	7.63	7.81	
	B_7	20.00	20.31	21.16**	
	Average (A x C)	10.82**	11.88	Average (B)	
Average (B x C)	B_1	16.44	16.50	16.47	
	B_2	7.53	6.81**	7.17**	
	B_3	13.22	13.12	13.17	
	B_4	8.50	8.47	8.48	
	B_5	15.16	19.56**	17.36**	

		B_6		10.28		10.69		10.48
		B_7		22.06		22.81**		22.43**
Average (C)				13.31		13.99*		Interactions (A x B x C)
Factors	**A**	**B**	**C**	**AB**	**AC**	**BC**	**ABC**	
LSD	**1 %**	1.87730	0.47204	0.74588	1.62407	2.56620	1.12965	4.98022
	5 %	1.36251	0.35861	0.56664	1.11628	1.76383	0.83732	3.00284

After statistical processing of the results on the vulnerability of ash in encampments, through analysis of variance was found to have significant differences as regards cultivars (Fak.A). Thus the index higher pathogen infestation after cultivar has Frankovka (25.95 %), while the lowest Burgundez black cultivar (20.36 %). So in the same conditions of cultivation Burgundez black cultivar showed rezistushmeri higher ash ndai pathogen. Significant differences were observed in terms of efficiency and preparations (Fak.B) compared with control or even in the middle of preparations. The highest rate of infection has been to control - B7 variant (48.47 %), while the lowest variant B2 (12.71 %) which is used Falcon EC460 and Bayleton preparation.

There were also significant differences between chemicals, where higher index of disease was to option B1 (24.25 %) which are used QUADRIS preparation and Cosa, while the lowest variant. B2 (12.71 %) where the preparation is used Falcon EC460 and Bayleton. Significant differences were also found to block (Fak.C), where C1 block had the lowest index (19.97 %). Regarding interactions A x B (cultivar x preparation) index was higher on control B7 to both cultivars compared with sprinkled variants. By interaction (A x B) The highest index was found to cultivar disease Frankovka - B1 variant (26.94 %) which are used QUADRIS preparation and Cosa, while the cultivar lowest Burgundez black - B2 variant (9 , 06 %) which was used Falcon EC460 and Bayleton preparation .Even the interactions (A x C) between cultivars and blocks have been the difference sinjifikative. Indeksi highest infection from the pathogen has been Frankovka cultivar (26.89 %), while the lowest Burgundez black cultivar (20, 07 %). With regard to interaction (B x C) between preparations and blocks are also found statistically significant differences. The higher value of the index after controlling disease has been the option B1 x C2 (25.06 %) and lowest among variant B2 x C1 (11.81 %).

Tab 2. Analysis of variance and LSD for grace (U. necator) in the bunch (2013)

Cultivar Fac.(A)	**Preparation Fac. (B)**	***Blocks, Fac. (C)***		**Average (A x B)**	**Average (A)**
		C_1	**C_2**		
Frankovka	**B_1**	26.75	27.13	**26.94****	**25.95****
	B_2	14.25	18.50	**16.38****	
	B_3	22.88	25.75	**24.31**	
	B_4	17.25	19.75	**18.50**	
	B_5	25.38	24.13	**24.75**	
	B_6	20.00	22.75	**21.38**	
	B_7	48.63	50.25	**49.44****	
	Average (A x C)	**25.02**	**26.89****		
Black Burgundez	**B_1**	20.13	23.00	**21.56****	**20.36****
	B_2	9.38	8.75	**9.06****	
	B_3	17.75	19.44	**18.56**	
	B_4	12.00	12.50	**12.25**	
	B_5	19.50	18.13	**18.81**	
	B_6	14.50	15.13	**14.81**	
	B_7	47.25	47.75	**47.50****	
	Average (A x C)	**20.07****	**20.67**	**Average (B)**	
Average (B x C)	**B_1**	**23.44**	**25.06****	**24.25****	
	B_2	**11.81****	**13.62**	**12.71****	
	B_3	**20.31**	**22.59**	**21.45**	
	B_4	**14.62**	**16.12**	**15.37**	

		B_5	**22.44**	**21.13**	**21.78**			
		B_6	**17.25**	**18.94**	**18.09**			
		B_7	**47.94**	**49.00****	**48.47****			
Average (C)			**19.97****	**23.78****	**Interactions (A x B x C)**			
Factors		**A**	**B**	**C**	**AB**	**AC**	**BC**	**ABC**
LSD	1 %	3.77739	1.09191	1.08339	3.75672	3.72742	1.64082	7.23379
	5 %	2.74155	0.82951	0.82304	2.58212	2.56197	1.21622	4.36164

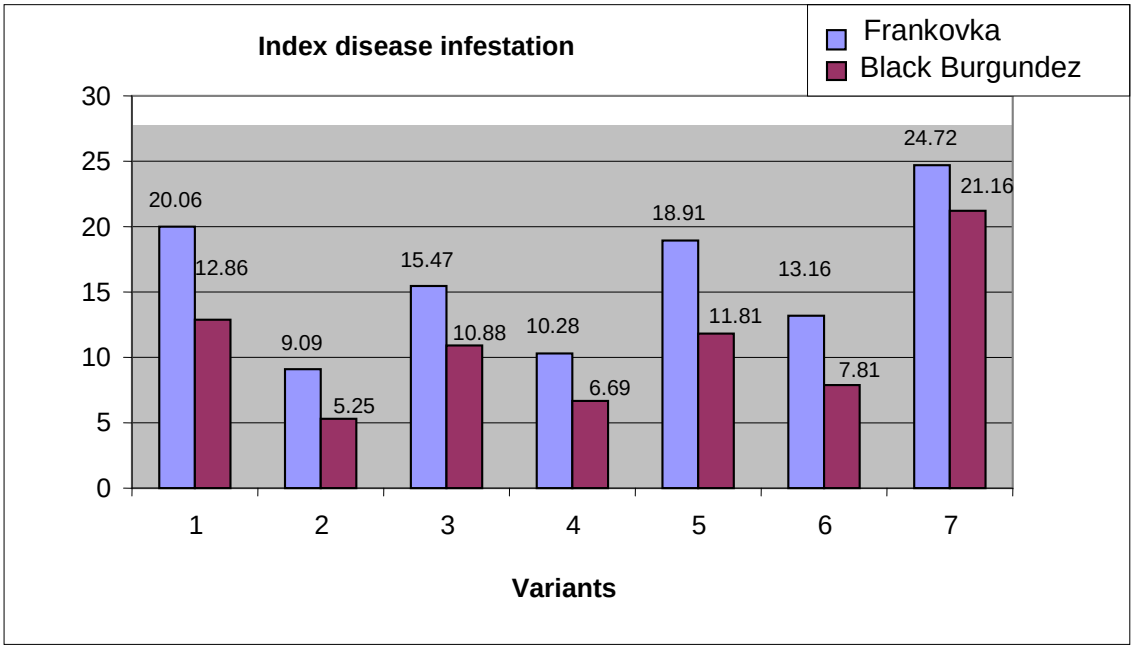
According to the author Beresford (2005) Use of preparations Strobilurineve group are allowed a maximum of two to three treatments at the beginning of vegetation in order to avoid creating resistant species.

Even in our study we did the first two treatments with no preparation was first drafted and then we continue with Cosa preparation treatments. According to the survey results is obvious that adjustments fungicides have shown better results in controlling the ash (in leaves and castles) in comparison with those of contact. But always should consider the risks of resistant strains.

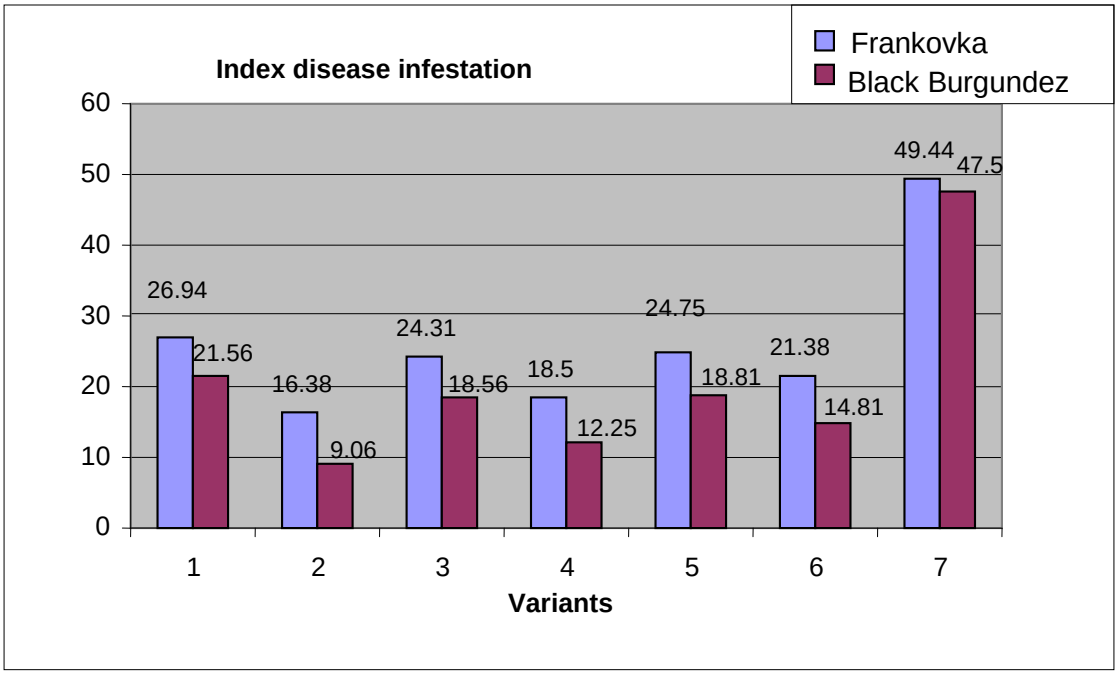
This data coincides with those of several authors (Spasic et al, 1980), who have concluded that, fungicides adjustments: Triadimefon (Bayleton), Heksakonazol (Anvil), Fenarimol (Bayleton) etc.

Have given good results in controlling ash compared with organic preparation Karathan (Dinokap).

Graphical presentation of the disease index



Graph 1. Grace in leaves (2013)



Graph 2. Grace in bunch (2013)

Conclusions

- For protection from pathogen vine ash (to cultivars Burgundez Frankovka and black) better success Bayleton showed systemic preparations and compared with EC460 Falcon contact preparations and organic.
- Of all the combinations (variants) used, second variants (which are used Bayleton preparation and Falcon EC460) are the most successful show where the disease index was the lowest.
- Regarding the other variants of the study conclude that other variants of preparation used Falcon EC460 and Anvil is shown with high efficiency against pathogen vine ash.
- In order not to appear strains resistant to vine protection against ash should not only use systemic preparations but they must be combined with the use of organic preparations and contact them.
- Regarding the suitability of cultivars to pathogen of ash, black Burgundez cultivar is more durable than ash to Frankovka cultivar.

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